

HL Paper 1

The volume V of a cylinder of radius R and height H is given by $V = \pi R^2 H$. The volume of the cylinder was measured with an uncertainty of 10% and the height was measured with an uncertainty of 6%. What is the uncertainty in the radius of the cylinder?

- A. 1%
- B. 2%
- C. 4%
- D. 8%

Two lengths, a and b , are measured to be 51 ± 1 cm and 49 ± 1 cm respectively. In which of the following quantities is the percentage uncertainty the largest?

- A. $a + b$
- B. $a - b$
- C. $a \times b$
- D. $\frac{a}{b}$

What is a correct value for the charge on an electron?

- A. 1.60×10^{-12} μC
- B. 1.60×10^{-15} mC
- C. 1.60×10^{-22} kC
- D. 1.60×10^{-24} MC

A ball is thrown with velocity u at an angle of 55° above the horizontal. Which of the following is the magnitude of the horizontal component of velocity?

- A. $u \cos 55^\circ$
- B. $u \sin 55^\circ$
- C. u
- D. $u \tan 55^\circ$

Which of the following expresses the units of capacitance in terms of fundamental units?

A. $s^4 A^2 m^{-2} kg^{-1}$

B. $s^2 A m^{-2} kg^{-1}$

C. $s^4 A^2 m^{-2}$

D. $s^2 A m^{-2}$
